Claims:

1. A method of performing vision processing comprising:

producing a depth map of a scene proximate a platform, wherein the depth map is based on an assumed ground plane;

identifying an actual ground plane using the depth map; and

compensating the depth map for differences between the assumed ground plane and the actual ground plane.

2. The method of claim 1 further including the step of comparing the depth map to a plurality of templates to identifying a match between the depth map and at least one template.

3. The method of claim 2 further including the step of adjusting a parameter of the platform in response to a match.

4. The method of claim 2 wherein the parameter of the vehicle comprises at least one parameter selected from the group of: an air bag deployment parameter, a seatbelt parameter, a vehicle height parameter, and a vehicle velocity and/or acceleration control parameter.

5. The method of claim 2 wherein the comparing step includes determining a difference between each pixel in the depth map and each similarly positioned pixel in a template, and determining that a pixel is a match if the difference at each pixel is less than a predefined amount.

6. The method of claim 2 further comprising:

accessing at least one template from a database comprising a plurality of templates.

7. The method of claim 6 wherein the plurality of templates represent objects at varying positions and poses relative to the platform.

8. The method of claim 6 wherein at least one template in the plurality of templates

is a model of a vehicle.

9 The method of claim 6 wherein at least one template in the plurality of templates is a model of a pedestrian.

10. The method of claim 1 further including the step of removing the actual ground from the depth map.

11. A method of performing vision processing comprising:

stereo imaging a scene about a platform to produce stereo image data;

producing a map of data from the stereo image data, wherein the map is based on an assumed ground plane;

identifying an actual ground plane using the map;

compensating the map for differences between the assumed ground plane and the assumed ground plane; and

removing the actual ground plane from the map.

12. The method of claim 11 further including the step of comparing a plurality of templates to the map to identifying a match between the map and at least one template.

13. The method of claim 12 further including the step of adjusting a parameter of the platform in response to a match.

14. The method of claim 13 wherein the parameter of the vehicle comprises at least one parameter selected from the group of: an air bag deployment parameter, a seatbelt parameter, a vehicle height parameter, and a vehicle velocity and/or acceleration control parameter.

15. The method of claim 12 wherein the comparing step includes determining a difference between each pixel in the map and each similarly positioned pixel in a template, and determining that a pixel is a match if the difference at each pixel is less than a predefined amount.

16. The method of claim 13 further including accessing at least one template from a database comprising a plurality of templates.

17. A collision avoidance system comprising:

a collision detection system comprising:

a stereo camera pair for producing imagery of a scene;

a stereo image preprocessor for preprocessing said imagery;

a map generator for producing from said preprocessed imagery a map referenced to an assumed ground plane; and

a target processor for determining the actual ground plane from said map.

18. A system according to claim 17, wherein the target processor removes the actual ground plane from the map.

19. A system according to claim 17, wherein the collision detection system further includes a collision detector for determining if a collision is imminent;

wherein said collision detector detects a potential threat in said map;

wherein said collision detector estimates size, position, and velocity of said detected potential threat;

wherein said collision detector performs a trajectory analysis of said detected potential threat using said estimated position and said estimated velocity;

wherein said collision detector predicts a collision based on said trajectory analysis; and

wherein said collision detector determines if a collision is imminent based on said collision prediction and on said estimated size.

20. The system according to claim 19 further including a secondary sensor that provides said collision detector with information regarding the scene.

21. A computer readable medium storing a vision system program that controls a computer to:

produce a depth map from input imagery;

determine an actual ground plane from said depth map; and

correct the depth map based on the actual ground plane.

22. A computer readable medium according to claim 21 that further controls a computer to;

detect a potential threat in said corrected depth map;

estimate a size of said detected potential threat;

estimate a position of said detected potential threat;

estimate a velocity of said detected potential threat;

perform a trajectory analysis of said detected potential threat using said estimated position and said estimated velocity;

perform a collision prediction based on said trajectory analysis; and

determine if a collision is imminent based on said collision prediction and on said estimated size of said potential threat.

23. The computer readable medium of claim 20 that further controls a computer to remove the actual ground from the corrected depth map.

24. A collision avoidance system comprising:

a collision detection system comprising:

a stereo camera pair for producing imagery of a scene;

a stereo image preprocessor for preprocessing said imagery;

a map generator for producing from said preprocessed imagery a map referenced to an assumed ground plane; and

a target processor for determining the actual ground plane from said map and for removing that ground plane from said map.

25. A computer readable medium storing a vision system program that controls a computer to:

produce a depth map from input imagery;

determine an actual ground plane from said depth map; and

removing the actual ground from the depth map.

26. A method of performing vision processing comprising:

producing a depth map of a scene proximate a platform, wherein the depth map is based on an assumed ground plane;

identifying an actual ground plane using the depth map; and

correcting the original stereo images for differences between the assumed ground plane and the actual ground plane.

27. The method of claim 26 wherein the technique of correction is a vertical translation of the original stereo images.

28. The method of claim 27 wherein the corrected stereo images are processed to refine the estimated height and width of the target.

29. A collision avoidance system comprising:

a platform;

a collision detection system on said platform, said collision detection system comprising:

a stereo camera pair for producing imagery of a scene;

a stereo image preprocessor for preprocessing said imagery;

a map generator for producing from said preprocessed imagery a map referenced to an assumed ground plane; and

a target processor for determining the actual ground plane from said map and for correcting the original stereo images based on the actual ground plane.

30. A computer readable medium storing a vision system program that controls a computer to:

produce a depth map from input imagery;

determine an actual ground plane from said depth map; and

correcting the original stereo images based on the actual ground plane.